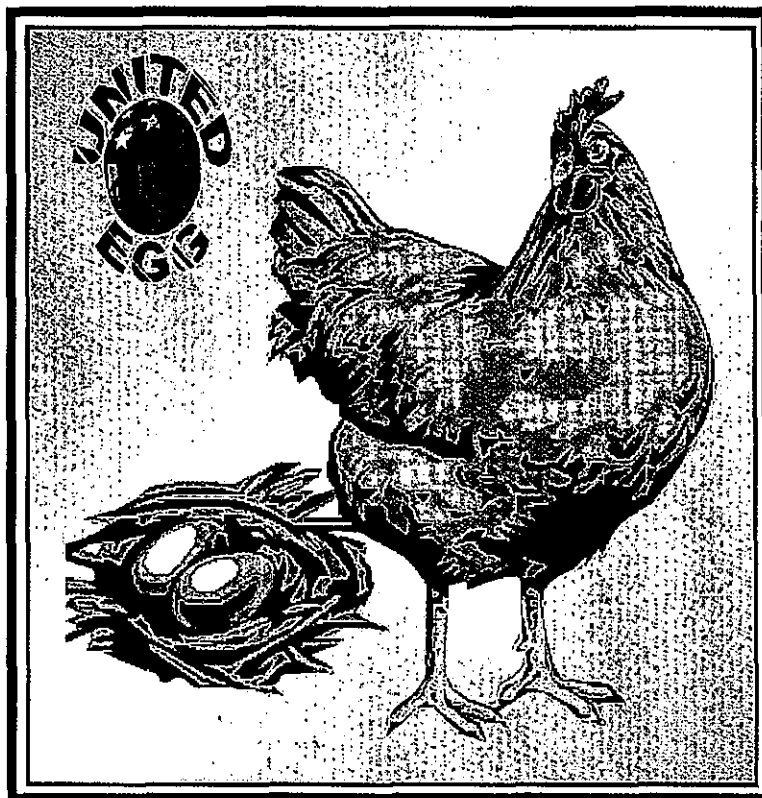


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ANIMAL HUSBANDRY

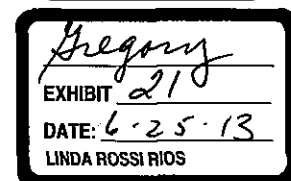
GUIDELINES FOR



U.S. EGG

LAYING FLOCKS

2000 EDITION



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United Egg Producers

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November 13, 2000

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Egg Nutrition Center

Dr. Don McNamara
Executive Director

Dr. Jill Snowden
Director of Food Safety Programs

Dear UEP/UEA Members and Friends:

Nearly two years ago, UEP commissioned a Scientific Advisory Committee for Animal Welfare. These respected scientists have taken the role of making recommendations to the egg industry very seriously and are to be thanked for their many hours and days of work without pay.

The scientific recommendations were presented to UEP's Board of Directors for approval. A Producer Committee for Animal Welfare was formed with these goals in mind.

1. Turn the scientific report into a set of husbandry guidelines for the industry.
2. Develop a phase-in plan for implementation.
3. Develop a model spreadsheet of cost.

We are now pleased to share with you the completed document of Husbandry Guidelines for the egg industry. You will also find a model cost spreadsheet enclosed. Please understand that this is simply a model to be used as a guide for each company to insert their own costs.

The Scientific and Producer committee have developed a road map for the future. Recognizing the marketing and political pressure, they were proactive and developed a set of guidelines based upon science instead of emotions or personal opinions.

This road map does not demand immediate changes but does give producers an opportunity to be prepared when their customer wants changes. This road map also gives them the timeline in which to make voluntary changes.



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Page Two
UEP/UEA Members and Friends Letter
November 13, 2000

Having worked as the staff coordinator with both these committee has given me a deep appreciation for the difficult task they undertook. This industry will be indebted to them.

You may want to share a copy of these guidelines with your customers. If so let us know how many additional copies you need. We will try to meet all requests.

Finally let us express our thanks to American Egg Board (AEB) for the funding they contributed toward this project.

Sincerely,



Gene W. Gregory
Senior Vice President

GWG/ph

**Production Cost Projections For
Phase-In Schedule For
Cage Space Allowances

(Estimated)**

Production Cost Projections
Phase In Summary

Category	48 Sq. In. Standard Cost Per Dozen	53 Sq. In. Net Cost Per Dozen	60 Sq. In. Net Cost Per Dozen	64 Sq. In. Net Cost Per Dozen	67 Sq. In. Net Cost Per Dozen	72 Sq. In. Net Cost Per Dozen
Feed Cost	\$0.2040	\$0.2117	\$0.2155	\$0.2176	\$0.2192	\$0.2192
Pullet Amortortization	\$0.0685	\$0.0728	\$0.0785	\$0.0816	\$0.0840	\$0.0874
Labor	\$0.0450	\$0.0492	\$0.0556	\$0.0590	\$0.0619	\$0.0654
Repairs & Maintenance	\$0.0050	\$0.0055	\$0.0062	\$0.0066	\$0.0069	\$0.0073
Utilities	\$0.0045	\$0.0049	\$0.0056	\$0.0059	\$0.0062	\$0.0065
Depreciation	\$0.0344	\$0.0377	\$0.0424	\$0.0451	\$0.0471	\$0.0506
Insurance	\$0.0020	\$0.0022	\$0.0025	\$0.0026	\$0.0027	\$0.0029
Other	\$0.0055	\$0.0060	\$0.0068	\$0.0072	\$0.0076	\$0.0080
Administration / Service	\$0.0150	\$0.0164	\$0.0185	\$0.0197	\$0.0206	\$0.0218
Interest Expense	\$0.0318	\$0.0343	\$0.0376	\$0.0395	\$0.0408	\$0.0431
Production Expense	\$0.4156	\$0.4407	\$0.4691	\$0.4846	\$0.4971	\$0.5123
Grade/Yield Adjustment	\$0.0000	\$0.0037	\$0.0080	\$0.0103	\$0.0122	\$0.0144
Total Production Expense	\$0.4156	\$0.4444	\$0.4771	\$0.4950	\$0.5092	\$0.5267
Cost Increase	\$0.0000	\$0.0288	\$0.0615	\$0.0793	\$0.0936	\$0.1111
Eggs Per Hen Housed	333	335	337	338	339	339
Feed Conversion	3.40	3.44	3.51	3.54	3.57	3.57
Feed Cost Per Ton	\$120	\$120	\$120	\$120	\$120	\$120
Cost Per Pullet	\$1.90	\$2.03	\$2.20	\$2.30	\$2.38	\$2.47
Investment Per Bird	\$8.00	\$8.83	\$10.00	\$10.67	\$11.17	\$12.00
Utilization - % Cationed	87.00%	87.00%	87.00%	87.00%	87.00%	87.00%

UTILIZATION OF 60%

Production Expense	\$0.4156	\$0.4407	\$0.4691	\$0.4846	\$0.4971	\$0.5123
Grade/Yield Adjustment	\$0.0000	\$0.0167	\$0.0357	\$0.0460	\$0.0543	\$0.0644
Total Production Expense	\$0.4156	\$0.4574	\$0.5048	\$0.5307	\$0.5514	\$0.5767
Cost Increase	\$0.0000	\$0.0418	\$0.0892	\$0.1150	\$0.1358	\$0.1611

UTILIZATION OF 40%

Production Expense	\$0.4156	\$0.4407	\$0.4691	\$0.4846	\$0.4971	\$0.5123
Grade/Yield Adjustment	\$0.0000	\$0.0376	\$0.0803	\$0.1035	\$0.1222	\$0.1450
Total Production Expense	\$0.4156	\$0.4783	\$0.5494	\$0.5882	\$0.6192	\$0.6573
Cost Increase	\$0.0000	\$0.0626	\$0.1338	\$0.1726	\$0.2036	\$0.2417

8/16/00

4:30 PM

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THE U.S. EGG INDUSTRY

The commercial egg industry in the U.S. has grown rapidly over the past 50 years, and its growth reflects the changing needs of our society. Today, just 2% of the population lives on farms, producing food for the remaining 98% of us. As people moved into the cities and suburbs with fewer people raising their own food, the demand for eggs increased while the supply diminished. The modern egg industry was born in response to this demand.

As late as the 1940s, small backyard flocks of chickens made up the majority of the egg producing industry. After these chickens had laid a relatively small number of eggs, they were consumed for meat. Then hens entered into a natural molt during the winter months and stopped producing eggs. Consumers wanting to purchase eggs during the winter months had to receive them from cold storage, which quite often meant nothing more than simply the producer's basement. The eggs could be several weeks old by the time the consumer actually received them.

Backyard chickens, continuously subjected to diseases, freezing, predators, poisoning, and infighting, had a precarious existence and a normal mortality rate as high as 40% per year. Average yearly egg production was little more than 100 eggs per year of which many were contaminated by the microbes from poultry diseases.

To meet a growing demand, farmers needed to upgrade their production facilities while keeping in mind the health and welfare of their birds. They also recognized the need to deliver eggs to the market in the most economical manner possible. The modern day cage system was found to be the one system that could meet both requirements.

To a large degree, poultry husbandry practices have been researched by land grant colleges and universities and have been adopted by farmers and the allied industry. As a result, today's husbandry practices have been shaped by research and innovation.

Today, we would estimate that 98% or more of the commercial egg production in the U.S. and an estimated 70-80% of the world's egg production are derived from caged layers. Even though a trend away from cages is seen in some European countries, the increasing use of cages in developing countries will continue to increase the percentage and population of layers housed in cages worldwide.

Modern egg farms, operating in a completely free market system with no government assistance programs or quotas, require large capital investments. While these farms have grown to meet the market demand, they are still classified as "Family Farms" with the owner still being on the farm making day-to-day decisions. Only two egg production companies in the U.S. share ownership with publicly traded stocks.

HUMANE GUIDELINES FOR U.S. EGG LAYING FLOCKS

PUBLIC PERCEPTIONS:

Poultry production practices have generated public discussion about the well being of laying hens. Concerns about the welfare of farm animals have arisen in developed nations because of public interest in, and expectations regarding, the use and treatment of animals. A basic understanding of how welfare concerns are manifested in our society is important when charting courses for future poultry production practices and responses to consumer concerns.

Surveys and polls show that consumers have clearly indicated that they retain confidence in farmers and ranchers to make responsible decisions concerning the welfare of animals. They also show that consumers regard the humane treatment of farm animals as important and that their ethical perspectives on animal treatment are continuing to evolve.

Maintaining the present level of consumer confidence is critical to the egg production industry. Therefore, it is the responsibility of the industry to make carefully researched and considered decisions regarding hen welfare. Producers who adopt sound guidelines for the welfare of their hens and incorporate these into their production operations will have a solid base from which to reassure the public that they are practicing good management and care for their birds.

UEP'S MISSION:

United Egg Producers developed the first industry guidelines in the early 1980s. Recognizing the growing concern for animal welfare worldwide, UEP commissioned a Scientific Advisory Committee for Animal Welfare in 1999. This scientific committee was asked to review the scientific literature on specific topics relevant to the well being of laying hens and to identify areas where further research is needed. Additionally, the committee was asked to develop recommendations based upon existing science for presentation to the UEP Producer Committee for Animal Welfare and ultimately to the industry. The Scientific Committee took no responsibility for mandating these recommendations, recognizing that the producers must voluntarily accept and implement them.

The recommendations and guidelines found within this document have been accepted by and presented here by the Producer Committee using the recommendations from the Scientific Committee as a blueprint.

This document will provide recommendations for the following management practices. This is a living document subject to changes as new scientific information becomes available.

- Housing and Cage Space Allowance
 - Beak Trimming
 - Molting
 - Transportation and Handling
-

SCIENTIFIC ADVISORY COMMITTEE MEMBERS

United Egg Producers asked Dr. Jeffrey Armstrong to serve as Chairman of this committee, requesting that he personally select the most qualified persons available to assist him in this endeavor. Those serving on the committee are listed below:

Dr. Jeffrey Armstrong

Head, Department of Animal Science, Purdue University

Adele Douglass

American Humane Association, Washington, D.C.

Donald Bell

Poultry Specialist, University of California, Riverside

Dr. Bill Chase

Veterinarian, Kestrel, Inc.

Dr. Patricia Hester

Professor of Animal Sciences, Purdue University

Dr. Joy Mench

Professor, Department of Animal Sciences, University of California, Davis

Dr. Margaret Shea-Moore

Research Leader, Livestock Behavior Research Unit
USDA/ARS

Dr. Ruth Newberry

Assistant Professor/Department of Animal Sciences and Department of Veterinary and
Comparative Anatomy, Pharmacology and Physiology
Washington State University

Dr. Larry Stanker

Research Leader, Food and Feed Safety Research
USDA/ARS

Dr. Janice Swanson

Associate Professor, Animal Science and Industry
Kansas State University

RECOMMENDATIONS AND GUIDELINES

HOUSING AND SPACE ALLOWANCE:

Numerous studies have shown that decreasing space allowance in cages to below a range of 67-86 square inches per hen significantly reduces hen-housed egg production and increases mortality.

Cage space will vary depending on type of cages and birds being housed. For example, space allowance can be at the low end of the range in shallow cages in which small Leghorn strains are housed, but should be at the higher end of the range in deep cages housing larger strains like Brown hens.

Housing for chicks, pullets, and hens should be constructed and maintained to provide protection for the birds from environmental extremes and predators. The birds should be managed in a manner that minimizes transmission of disease, infection with parasites, and vermin infestation in accordance with accepted principles for disease prevention. House and cage design must facilitate optimal daily care and inspection of the birds.

Cages should be designed and maintained so as to avoid injury to the birds. Cage, feeder, and waterer construction should take into account proven advantages for bird comfort and health, and facilitate the safe removal of birds.

RECOMMENDATIONS

While most of these recommendations are currently being used or can be implemented rather quickly, the recommendations dealing with cage configuration and size are intended for new construction or to be implemented along the recommended phase-in schedule found later in this document. Variances due to unalterable features of existing equipment will be permitted for the useful life of that equipment.

1. Cage configuration should be such that manure from birds in upper cage levels does not drop directly on birds in lower level cages.
 2. All hens should be able to stand comfortably upright in their cage. The slope of the cage floor should not exceed 8 degrees.
 3. Space allowance should be in the range of 67 to 86 square inches of usable space per bird to optimize hen welfare.
 4. Feeder space should be sufficient to allow all birds to eat at the same time.
-

5. Chicks, pullets and hens should have continuous access to clean drinking water. However, water may be shut off temporarily in preparation for administration of vaccines or medication in the water. The manufacturer's guidelines for the number and placement of drinkers should be consulted, but general recommendations for watering space for layers are as follows:

<u>Age</u>	<u>Linear trough space/bird</u>	<u>Maximum number of birds Per cup or nipple</u>
0-6 wks.	0.6 inches	20
6-18 wks.	0.8 inches	15
older than 18 wks.	1.0 inches	12

Perimeter space needed for round waterers can be determined by multiplying linear trough space by .8.

6. Water pressure must be regulated carefully with some automatic devices and watering cups. Manufacturer recommendations should be used initially and adjusted if necessary to obtain optimal results. Automatic watering devices may require frequent inspection to avoid malfunctions.
7. Poultry houses should be designed to provide a continuous flow of fresh air for every bird. Sufficient ventilation to minimize levels of carbon monoxide, ammonia, hydrogen sulfide and dust is critically important. Ammonia concentration to which the birds are exposed should ideally be less than 25 ppm and should not exceed 50 ppm for a 24 hour TWA (Time-Weighted-Ave.), but temporary excesses should not adversely affect birth health.
8. Lights should be provided to allow effective inspection of all birds. Inspection of the birds should be conducted daily.
9. Birds should not be exposed to disturbing noises or visual stimuli or strong vibrations, whether originating inside or outside the house. Visitors should not be allowed without proper supervision, because they could cause birds to panic and injure themselves in their rush to escape and for biosecurity reasons. Wild birds, pets, and other animals should, likewise, not be allowed in the poultry house.
10. Environmental conditions within the house should allow the birds to maintain their normal body temperature without difficulty.
11. Nutritionally adequate fresh feed must be easily accessible to all birds and care shall be taken at each change of the systems to insure that the birds find the feed.
12. Stand-by generators with alarm systems are a "must" in highly mechanized layer and pullet houses. Such systems should be sufficient to supply emergency power for lighting, watering, ventilation, feeding, egg collection, and manure removal.

BEAK TRIMMING

Scientific evidence suggest that primary breeders of egg laying strains can select a more docile bird and minimize the need to beak trim, from a behavioral point of view. Using genetic stocks that require little or no beak trimming is the most desirable approach. However, under certain management systems (e.g., exposure to high intensity natural lighting) and with some genetic stocks, beak trimming is recommended. Therapeutic beak trimming is recommended at any age if an outbreak of cannibalism occurs.

Advantages of beak trimming may include reduced pecking, reduced feather pulling, reduced cannibalism, better feather condition, less fearfulness, less nervousness, less chronic stress, decreased mortality.

Bird behavior, production, physiological measurements of stress, as well as neural transmission and anatomy of the beak have been used as criteria to determine if beak trimming compromises animal well-being. In addition, the welfare of those birds that are pecked by beak-intact birds has been evaluated. Welfare disadvantages are applicable to individual birds whose beaks are trimmed and may include the bird's ability to feed itself following beak trimming, short-term pain, perhaps chronic pain, and acute stress.

RECOMMENDATIONS FOR SINGLE - TRIM PROGRAM

1. The beaks of chicks should be trimmed at 10 days of age or younger with a precision automated cam-activated beak trimmer with a heated blade.
2. Crews responsible for beak trimming must be trained and monitored for quality control.
3. Approximately 2 days before and 2 to 3 days after beak trimming, vitamin K (5 mg/liter or 20 mg/gallon) and sometimes Vitamin C (20 mg/liter or 80 mg/gal) should be added to the water to facilitate clotting, to alleviate stress, and reduce dehydration.
4. The levels of feed and water should be increased until beaks are healed.
5. Recently beak trimmed chicks may have difficulty activating watering devices; therefore, producers should consider incorporating management procedures to facilitate the bird's ability to drink. Examples include lowering water pressure or manually triggering cup waterers for several days following trimming.

6. To minimize weight loss, birds can be fed a prestarter, starter, or high-density stress diet for about 1 week following beak trimming.
7. The blade and the guide holes of the beak trimmer should be cleaned regularly.

RECOMMENDATIONS FOR A SECOND - TRIM PROGRAM

If the trimmed beak grows back, a second trim may be needed. A second trimming is more permanent in that the beak does not grow back as easily. Some strains of layers, especially under conditions of high light intensity, may need to be subjected to a second trim when pullets are 5 to 8 weeks of age.

Beak trimming is not recommended after 8 weeks of age.

When avoidable, birds should not be subjected to stressful conditions such as handling, moving, vaccination, etc., for two weeks following beak trimming.

MOLTING

Consumer concerns about agricultural production practices and the impact of these practices on the welfare of the animal have caused producers to reconsider the use of induced molting in laying strains of birds. Welfare problems reside with the methods used to induce the molt, namely feed restriction or deprivation, rather than with molting per se.

Molting is currently an integral part of the replacement programs used on egg farms to extend the life of the hen and rejuvenate the reproductive cycle of the bird. Therefore, the molting period allows the flock a period of rest at the end of a period of egg production.

Molting results in the use of approximately 50% fewer hens than would be needed to supply the consuming market with eggs if induced molting was not allowed. This in turn results in significantly fewer spent hens that have to be handled, transported, and slaughtered.

A fast of 4 to 5 days will usually cause a flock to cease egg production. Longer fasts will usually give superior results, but extreme care must be taken to monitor body weight loss and mortality daily during the fast, if such programs are to be used.

MOLTING RECOMMENDATIONS

Producers and researchers are encouraged to work together to develop alternatives to feed withdrawal for molting. These alternatives should include the following:

1. The hens should be able to consume nutritionally adequate and palatable feed.
2. Body weight loss should be sufficient so as not to compromise hen welfare during the postmolt period.
3. Mortality during the molt should not substantially exceed normal flock mortality.

However, until such time that these alternatives are available, the shortest period of feed withdrawal possible should be used to accomplish the goal of rejuvenating the hen's egg production capabilities and overall welfare.

Insufficient research has been conducted to develop a conclusive decision on the impact molting may contribute to food safety risks. Until such time that scientific research has provided the

needed answers, the following recommendation is made:

- All egg producers and processors should implement the UEP "5-Star" Total Quality Assurance Food Safety Program or one of the many excellent state programs.

Specific recommendations for conducting a molt using feed withdrawal or restrictions are as follows:

1. Cull birds should be removed from the flock before molting.
2. Flocks should be molted in such a way to minimize mortality and harm to the flock.
3. Mortality and body weight losses must be monitored daily during the molt period.
4. Feed should be returned when body weights reach no less than 70% of the starting weights.
5. Mortality should not exceed 1.2% during the feed withdrawal period.
6. Water must be available at all times.
7. Reduce light period to 8 hours in closed houses or to natural day length in open houses for the duration of the rest period. When the flock is placed back on a layer diet, lights should be returned to the normal layer program.

HANDLING, TRANSPORTATION AND SLAUGHTER

Leghorn-type hens tend to have relatively weak bones by the end of lay. As a result, there is a high risk of bone fractures occurring when they are handled prior to slaughter. Catching appears to be the primary source of injury prior to arrival at the slaughter plant.

Bones become weak when structural bone is broken down to obtain calcium for eggshell formation. It is important that all hens are able to consume sufficient calcium and phosphorus to support eggshell formation without loss of structural bone.

Prolonged fasting prior to slaughter results in bone loss, an increased risk of bone breakage during catching and reduced ability to withstand the rigors of transportation. These factors can lead to high rates of antemortem and postmortem condemnation.

When hens must be euthanized on the farm, cervical dislocation is an accepted method when performed by skilled workers. Carbon dioxide can be used to euthanize large numbers of hens in modified atmosphere killing (MAK) carts.

RECOMMENDATIONS FOR HANDLING, TRANSPORTATION AND SLAUGHTER

1. All members of a catching crew must be knowledgeable and skillful in handling hens with care. Crews must be supervised. Training of catchers could substantially reduce the risk of bone breakage and other injuries. Escape and dropping of hens must be minimized.
2. Hens should be handled so as to minimize bone breakage or injury. Good handling methods can include:
 - Removing hens from the cage one or two at a time by grasping both legs at the hock.
 - Supporting the hen's breast as she is lifted over the feed trough.
 - Handling hens in an upright posture.
3. Use the lowest light level possible without impinging on worker safety.

4. Minimize the amount of handling by using carts for flock removal from the house and transport to the processing plant. (Do not use hanging carts.)
5. The size of cage doors, crate doors and panels on trucks should be large enough to permit easy passage of hens to avoid bruising and injury.
6. Hens should be loaded only into clean, well-maintained transport containers and vehicles. Hens should be loaded into each transport container at a density appropriate for the weather conditions. The doors of transport containers must be closed securely so that hens do not escape in transit.
7. To help reduce the risk of bone breakage and health problems resulting in condemnation, in coordination with the processing plant, avoid fasting any hen for more than 24 hours prior to slaughter. Water withdrawal prior to removal of hens from the layer house is not recommended.
8. Coordination is needed between producers, catchers, truckers and processors to minimize the time between catching and slaughter and to avoid exposure of hens to excessive heat or cold during this period.

CAGE STOCKING DENSITY "PHASE-IN" PLAN

UEP's Animal Welfare Committee recognized that producers can not make immediate changes to the stocking density, because of flocks currently in production and replacement flocks which may already be in the growing houses.

We also realized that producers currently have only the number of egg production houses from which eggs are being produced to fill the marketplace. Any immediate changes would result in a shortage of eggs and therefore be a disservice to consumers. The industry needs sufficient time to build additional housing to accommodate the recommended stocking density.

In order for the industry to arrive at the minimum prescribed stocking density of 67 square inches within a reasonable time frame and without being disruptive to the marketplace, we propose the following phase-in schedule for consideration.

<u>Goal Date</u>	<u>Company Average Stocking Density</u>	<u>Minimum Stocking Density for new flocks housed.</u>
1/1/2002	-----	53 sq. in.
1/1/2003	48 sq. in.	53 sq. in.
1/1/2006	53 sq. in.	60 sq. in.
1/1/2009	64 sq. in.	67 sq. in.
1/1/2012	67 sq. in.	67 sq. in.



- ★ An employee training video for humane care of egg-laying hens will be provided to all egg producers in the U.S.
- ★ Anyone interested in receiving a copy of the Scientific Committee's report and recommendations may do so by writing United Egg Producers.
- ★ United Egg Producers wishes to thank American Egg Board (AEB) for their financial support of this project.
- ★ United Egg Producers also wants to thank the following egg producers for participation in the Producer Committee for Animal Welfare. Without their expertise these guidelines would not have been possible.

Barrie Wilcox
Paul Bahan
Kurt Kreher
Kurt Lausecker
Steve Storm
Dr. Rich Dutton

Joe Arias
Mike Bynum
Bob Krouse
Garth Sparboe
David Thompson





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